DERIVADOS DEL FLUOR	SAFETY DATA SHEET	FDS-12-I
		PAGE 1 OF 8
		REVISION: 7
		DATE: JUN/ 2014

HYDROFLUORIC ACID ≤ 60%

1. IDENTIFICATION OF THE SUBSTANCE AND THE COMPANY OR ENTERPRISE

1.1. Identification of the substance

Product name: Hydrofluoric Acid ≤ 60%

EC No. 231-634-8

CAS No. 7664-39-3

Registration No. 01-2119458860-33-0007

Product other names:

Hydro-hydrofluoric Acid ≤ 60%

Hydrogen Fluoride ≤ 60%

1.2. Relevant identified uses of the substance and uses advised against

- Picking of copper, brass and stainless steel.
- Dissolution of metals.
- Control of beer fermentation.
- Yeast manufacture.
- Production of fluorides and other fluorine compounds.
- Flotation of minerals.
- Cleaning outsides of stones or building bricks.
- Electropolishing of metals.
- Polishing, etching and frosting of glass..
- Purification of graphite.
- Purification of filter paper.
- Treatment prior to electroplating.

No data available of uses advised against.

1.3. Details of the supplier of the safety data sheet

Company name: DERIVADOS DEL FLÚOR, S.A.U.

Address: ONTÓN – CASTRO URDIALES

39706 – ONTÓN / CANTABRIA (ESPAÑA)

Phone: +34 942 87 99 00; Fax: +34 942 87 92 46

E-mail: ddf@ddfluor.com

1.4. Emergency telephone number

DERIVADOS DEL FLÚOR, S.A.U. (Telephone 24 h):

+34 942 87 94 00

Telephone of the Toxicology National Institute:

+34 91 562 04 20

2. HAZARDS IDENTIFICATION

2.1. Classification of the substance

Regulation 1272/2008:

Acute oral toxicity category 2

Acute cutaneous toxicity category 1

Acute inhalation toxicity category 2

Cutaneous corrosion category 1A

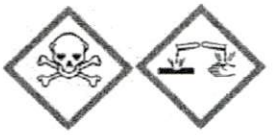
Directive 67/548/EEC: Very Toxic and Corrosive.

This product meets all safety guidelines according US OSHA 29 CFR 1900.1200

2.2. Label elements

Pictogram: GHSO6

GHS05



Signal word: Danger

H Phrases: H300, H310, H314, H330

P Phrases: P264, P301+P310, P405, P260, P361, P501.

Physicochemical hazards

Very volatile liquid. Its vapours, on contact with moisture, moist air, produce abundant and dense white fumes.

Hydrogen Fluoride, in abse nce of moistu re and at ambient temperature, does not attack steel, cop per, nickel aluminium or lead. On the contrary, its aqueous solutions attack most metals give off flammable gaseous hydrogen.

Reacts intensely (exothermic) with water and lye.

Reacts violently with oxi dant substances, giving off Fluor.

Environmental hazards

Toxic effect in fish and plankton, as well as in fixe d organisms, due to a variation in pH.

It is a strong air pollutant.

Hazards to human health

Very toxic on inhalation, ingestion and skin contact.

It causes serious burns.

The absorption of fluori de ions in the blood by inhalation of dust or fu mes, by ing estion or skin absorption can red uce serum calcium levels causing possible hypocalcaemia, as well as magnesium causing possible hypomagnesia, besides causing inhibition of vital enzymes. It can also cause dangerous and notable metabolic disorders and kidney and liver functions. In cases of prolonged and repeated exposures, the absorption of fluoride ions in the blood can cause fluorosis (fixation of calcium i the bones by fluorides).

The symptoms of overexposure to fluorides may include salivation, nauseas, vomi ting, abdominal pain, diarrhoeas, fever, hard breathing.

The symptoms of se vere poisoning include h ard breathing, pulmonary congestion, muscular spasms, convulsions, collapse.

2.3. Other hazards

It is not considered a PBT or vPvB substance.

3. COMPOSITION / NFORMATION ON INGREDIENTS

3.1. Substance

Chemical family: Inorganic Fluoride.
Chemical name: Hydrogen Fluoride, HF 60%

EC No.: 231-634-8

CAS No.: 7664-39-3

4. FIRST AID MEASURES

4.1. Description of first aid measures

Contact with the skin:

Direct contact of the liquid with t he skin cause immediate burns, which become more intense with time, though they may vary according to the contact time and th e speed of treatment, developing from erythema and vesicles to true burns with necrosis and ulceration.

Dilute solutions may also cause burns, which are scarcely noticeable at first.

Fluoride ions penetrate skin and tissue quickly, causing necrosis in soft tissue and decalcification in bones.

Unlike other acids, which are soon neutralized, this process can go on for days.

Several fatalities have been reported due to large-scale splashing. Death usually occurs suddenly 2-10 h ours after exposure due to respiratory problems and heart failure.

It can be absorbed through the skin in toxic amounts.

Immediately remove soiled or splashed clothing. Wash with plenty of water for at least 5 minutes, then rub with calcium gluconate at 2.5 % solution i nto the affected area until 15 minutes after local pain cea ses. If necessary, apply a dressing or bandage soaked in 10% calcium gluconate solution.

In case the re is n ot calcium gluconate available, washing with water should be prolonged for 15 minutes.

For skin burns bigger than a human ha nd (approx. 150 cm^2), administer also 6 effer vescent calcium ta blets dissolved in water (400 mg of calcium each) e very 2 hours until the patient is admitted to hospital.

For very widespread burns, give the p atient a full b ath in a solution of 1-5% calcium gluconate.

Medical treatment should be sought as soon as possible.

Contact with eyes

The substance is lachrymal and causes painful burns, which can result in permanent eye damage or blindness.

Wash the eyes immediately with abun dant water for 10-15 minutes keeping the lids open. Then wash with normal isotonic saline solution for 5 minutes.

See an ophthalmologist immediately.

Inhalation

Causes burns in the resp iratory tract. It can also cau se inflammation of the lu ngs, congestion, pulmonary oedema, fever and cyanosis, which may not appear until 12-24 h after exposure. It can be fatal.

Prolonged or repeated exposure to low concentrations of gas can cause nasal congestion , nosebleed and bronchitis.

It is almost impossible for anyone consciously to inhale enough HF to do serious damage, as it is too irritating to inhale it voluntarily.

Remove the affected person from the danger area, make him as comfortable as possible and protect him from the cold.

Administer calcium tablets as for skin contact. If his breathing is laboured, give him oxygen through a facemask.

Medical treatment should be sought as soon as possible.

Ingestion

It causes necrosis of the mouth, oesophagus and stomach. It can cause nausea, vomiting, diarrhoea and circulatory collapse. Orally administer 6 effervescent calcium tablets dissolved in water. If no such tablets are available, make the patient drink milk. Do not induce vomiting.

Medical treatment should be sought as soon as possible.

4.2. Most important symptoms and effects, both acute and delayed

The immediacy of treatment is essential to reduce the severity of the consequences ob burns or poison.

In either case it is always recommended the council / health care.

4.3. Indication of any immediate medical attention and special treatment needed

It is strongly recommended the presence of emergency showers and eye baths close to workstations.

Because of the singularity of fluorides burns and poisoning, accident assistance and emergency services at local hospitals should be duly informed of the specific and concrete medical treatment required.

5. FIREFIGHTING MEASURES

The product is non-combustible and non-comburent.

5.1. Extinguishing media

No restrictions in case of fire in the vicinity.

5.2. Special hazards arising from the substance

There is a danger of containers' bursting when affected by heat from fires close by. Remove containers to a safe area provided this operation can be performed safely. Spray water over the containers exposed to fire to cool them. When the containers are opened, ensure that there are not sparks or fire-starting devices in the vicinity.

Release of very toxic and corrosive HF.

5.3. Advice for firefighters

Breathing apparatuses and full chemical protective clothing should be worn when extinguishing fires.

6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Provide good ventilation. Those fighting the spill should wear suitable protective clothing (see section 8).

Restrict access to area until completely clean to people who do not use personal protective equipment. Prevent the entry of product in basements.

6.2. Environmental precautions

Prevent soil, water and drain pollution. Extracted air, which may be contaminated with large amounts of fumes, should be treated with a washing system using the moist way before being released into the atmosphere.

6.3. Methods and material for containment and cleaning up

If possible, upturn leaky container so that gas, rather than liquid, leaks out. Contain leaks with sand, earth or an absorbent material. Dilute with abundant water. Spray water to damp down gases/fumes that may be leaking out. Neutralize with lime. Do not tip waste down drains.

6.4. Reference to other sections

See sections 8 and 13.

7. HANDLING AND STORAGE

7.1. Precautions for safe handling

Provide good ventilation. Handle containers with care to prevent breaking or damaging the valves.

Handle and open the container with care due to a possible overpressure.

Empty, transfer, dilute, dissolve product, etc. according to strict guidelines to avoid local heating, splashes of liquid and emission of fumes. Prevent accumulation of partly spent containers. Partially used containers should be hermetically resealed after use and returned

to the store. Empty contai ners contain residues, so they should be handled as if they were full.

7.2. Con ditions for s afe storag e, including a ny incompatibilities

Keep containers hermetically sealed in a cool, well-ventilated place, protecte d against physical damage, heat and di rect sunlight and se parate from ea sily flammable materials. The containers should be inspected regularly for early detection of damag e or leakage Stores should be well away from busy working areas. They should have two exit doors as far apart as possible and personal protection equipment should be kept outside these doors.

In Spain, storag e must meet the R. D. 379/200 1 (Chemical products storage regulations) if the qu antity stored is above 50 l.

Suitable packagings are pressurized steel containers, steel containers under atmospheric pressure with gas cleaning system, tanks and ISO-containers.

7.3. Specific end use(s)

See section 1.2.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1. Control parameters

Limit level for repeated exposures:
VLA – ED: 1.5 mg (F) / m^3 – INSHT Guide.

Limit level for short time exposures:
VLA - ED: 1.5 mg (F) / m^3 - INSHT Guide.

Biological limit level – VLB

Biological indicator: Fluorides in urine.

End of working day: 8 mg /l. – INSHT Guide

Before shift: 4 mg /g creatinine, after s hift 7 mg /g creatinine – BAT.

DNEL: Derived no effect level

Exposure pattern	Route Val	ue	Effects	Population
Acute effects (systemic and local)	Inhalation	2.5 mg/m^3	Irritation (respiratory tract)	Workers
Long-term effects (systemic and local)	Inhalation	1.5 mg/m^3	Irritation (respiratory tract)	Workers

PNEC: Predicted No Effect Concentration

Value	
Fresh water	0.9 mg/l
Salt water	0.9 mg/l.
Sediments 0.766	mg/kg wwt

8.2. Exposure controls

Local exhausting is recommended to maintain fume emissions below the exposure lowest admissible level. It is also advisable the presence of anti-splash screens at points where product is used.

Appropriate engineering controls

To handle the product it should be compulsory to wear personal protective equipment.

Do not eat, drink o r smoke while working. Before breaks, wash ha nds. After work shower or wash. Change working clothes after handli ng the pro duct. Remove soiled or splashed clothing and wash it before re-using it. Shower an d washroom facilities should be separate from changing rooms. The substance must be kept away from food, drink and condiments.

Individual p rotection measur es, su ch as perso nal protective equipment

a) Eye / face protection

Well-fitted chemical protective goggles type motorist or diver, with plastic lenses (e.g. clear PVC), or a facial safety screen.

It is generall y known that contact lenses mu st not be wear when working with chemicals because they may contribute to the severeness of possible damages in the eyes.

b) Skin protection

In normal conditions, an apron of suitable material (e.g. Viton, Neoprene), normal protective overall with l ong sleeves, and chemical protective boots (Vi ton, Neoprene, etc.).

Additionally, for wo rks with possible contact with t he product, wear EPI's class 3, type 3 (liq uid tightness) of suitable material (Composite, Viton, PCV), an d for emergencies an EPI class 3 type 1 (g as-proof) of the same materials, with autonomous breathing equipment.

c) Hand protection

Chemical protective gloves of a suitable material (e.g. Viton, Neoprene, PVC)

d) Respiratory protection

If engineering checks, working, practices or administrative checks are not effe ctive in re ducing

concentrations to below legal limits for exposure, use breathing apparatus.

Depending on the level of fumes, the appropriate breathing equipments –all of them EPI's class 3-, can be a face mask with replaceable filters type E1 - E2, a hood with eye-window of suitable plastic and replaceable filters of the same type as the previous ones, or autonomous insulation equipments or with air line.

Environmental exposure controls

Specific gaseous emissions levels according to integrated environmental authorization

R. D. 833 / 1975 – Gaseous Immission (out of the manufacturing site) /

- Fluorides 60 µg / m^3 (30')
- Fluorides 20 µg / m^3 (1 day)

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

HF	60% HF	50% HF	40%
Appearance	Transparent, colourless liquid		
Odour A	crid		
Odorous threshold	0.04 to 0.13 ppm (AHF)		
Melting point / freezing point	-42°C -36°C		-45°C
Initial boiling point and boiling range	Approx 85° C at 1013 mbar	Approx. 106° C at 1013 mbar	12-113° C at 1013 mbar
Flammability point	Non-flammable		
Evaporation rate	No data available		
Flammability Non-flammable			
Explosivity Non-explosive			
Vapour pressure	Approx. 55 mbar at 20° C	Approx. 50 mbar at 20° C	9 mmHg at 25°C 34mmHg at 50° C
Vapour density	Variable according to polymerization grade, subject to temperature variation.		

Relative density	Approx. 1.21 g./cm^3 at 25° C	Approx. 1.195-1.20 g./cm^3 at 25° C	1,149 – 1,153 g/cm^3 at 0° C
Solubilities: Solubility in water	Miscible in all rations		
Solubility in other chemicals:	Very soluble in ethanol and other organic solvents		
Partition coefficient n/Octanol-water	No data available		
Auto-ignition temperature	Non-flammable		
Decomposition temperature	No data available		
Dynamic viscosity	No data available		
Explosive properties	Non-explosive		
Comburent properties	Non-comburent		

9.2. Other information

Miscibility: Miscible in water
Liposolubility: No data available
Conductivity: No data available

10. STABILITY AND REACTIVITY

10.1. Reactivity

Contact with steel, at a high temperature and/or moisture, and with many other metals, results in the emission of flammable gaseous Hydrogen.

10.2. Chemical stability

It is stable under normal conditions. It shows a great attitude towards polymerization, which is not considered dangerous.

10.3. Possibility of hazardous reaction

No data available.

10.4. conditions to avoid

Its heating.

10.5. Incompatible materials

It attacks silica, silicates and specially glass. It should not be kept in glass, cement, some vessels of metals containing silica, ceramics, natural rubber, leather and many other organic polymers. It reacts intensely with water, lye, oxidant salts (cyanides, hypochlorites...), and amines.

10.6. Hazardous decomposition products

No data available.

11. TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

a) Acute toxicity

Very toxic substance by ingestion, inhalation and in contact with the skin.

The EU RAR suggests that the liquid or gaseous hydrogen fluoride in contact with skin may cause serious injury, including systemic effects (cardiac).

Research with diluted hydrofluoric acid in contact with the skin of rabbits has shown local corrosive effects but no systemic toxicity.

No data are available for acute oral toxicity

b) Skin corrosion / irritation

Highly toxic and corrosive substance that causes rapid destruction of tissue in contact with the skin.

Corrosive effects occur with 5% HF. Contact with HF 20% is enough to cause damage to the skin of rats and even hypocalcaemia in case of prolonged contact. Small burns with HF 40% cause profound tissue necrosis in a short time, causing hypocalcaemia in 24 hours.

c) Serious eye damage/irritation

Strongly caustic action.

Human eyes - 50 mg - severe irritation.

d) Respiratory or skin sensitisation

The experience of fluoride ion sensitization is unlikely.

e) Germ cell mutagenicity

No symptoms leading to suspicion of mutagenic effect (Ames test). (Research conducted at the Institute of Toxicology, BAYER AG).

f) Carcinogenicity

There is no evidence of an association between cancer and exposure to inorganic fluorides (IARC).

g) Reproductive toxicity

There is no evidence that fluoride ion is toxic to reproduction.

h) Specific toxicity in certain organs (STOT) – single exposure

In view of the available data, the criteria for classification are not met.

i) Specific toxicity in certain organs (STOT) – repeated exposure

In view of the available data, the criteria for classification are not met.

j) Aspiration hazard

Very toxic and corrosive substance that causes rapid destruction of tissue by inhalation.

LC50 – rat: 4970, 2690, 2040 and 1310 ppm with exposures of 5, 15, 30 and 60 minutes respectively. It causes eye irritation and nasal and respiratory problems. With 18200 ppm in 5 minutes causes death within 24 hours from pulmonary oedema.

LC50 – Guinea pig: 4327 ppm / 5 minutes.

12. ECOLOGICAL INFORMATION

12.1. Toxicity

Toxic effect in fish and plankton, plants and foliage. Persistent in the soil. Soil will strongly bind fluoride if the pH is >6.5. High calcium content will immobilize fluorides also.

Prevent contamination of surface water, wastewater and ground.

12.2. Persistence and degradability

No experimental data available.

12.3. Bioaccumulative potential

The product has bioaccumulative potential in aquatic organisms.

12.4. Mobility in soil

The product has low mobility in soil. The soil natural alkalinity will slowly drive away the acidity. Soil will strongly bind fluoride if the pH is >6.5. High calcium content will also immobilize fluorides.

12.5. Results of PBT and vPvB assessment

It is not considered a PBT or vPvB substance.

12.6. Other adverse effects

Large leakages of HF to the aquatic environment could lead to over acidification with resultant damage to aquatic life.

Soluble fluoride may be toxic to aquatic organisms.

LC50 Fish – 60 ppm.

13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Use as much quantity of product as possible in the production cycle.

Residual solutions of hydrofluoric acid should be adequately treated before being evacuated. Residual solutions should be neutralized with an alkali being recommended lime better than sodium hydroxide. Add this alkali carefully, or in diluted solution form, to prevent excessive heat generation.

Treatment of containers

Use as much quantity of product as possible in the production cycle.

Eliminate by washing out small quantities of acid, neutralize with an alkali. Ensure that containers are completely neutralized before treating them as inert or recyclable material.

Other information

Before any elimination procedure, take advice of the national, autonomic and local legislation in force.
In Spain, the rules 11/97 – Packing and residues of packing-, and 10/98 –Residues rule-, are compulsory.

An authorized waste manager, or the product manufacturer, could cooperate / advise on such disposal.

14. TRANSPORT INFORMATION

1.4.1 UN Number

UN 1790

14.2. UN proper shipping name

Hydrogen Fluoride with not more than 60% of hydrofluoric acid.

14.3. Transport hazard classes

Road - ADR – Class 8 CT1

Rail - RID - Class 8 CT1

Sea - IMDG – Class 8

Air - ICAO – Forbidden

Hazard Number: 886

Hazard Label: 8 + 6.1

14.4. Packing group

Group II

14.5. Environmental hazards

It is not considered hazardous to the environment.

14.6. Special precautions for user

Keep away from foodstuffs and pharmaceuticals.

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

It is not carried in bulk.

15. REGULATORY INFORMATION

It is not included in Regulation (EC) 689/2008 on the export and import of dangerous chemicals.
This product is a Hazardous Chemical" as defined by OSHA Hazard Communication Standard, 29 CFR 1910.1200

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

In Spain, it is compulsory the 374/2001 R.D. about health protection and staff's safety against risks related to chemical agents while working.

Being very toxic, it is included in SEVESO category.

15.2. Chemical safety assessment

The safety assessments for each of the uses described in paragraph 1.2 are available.

16. OTHER INFORMATION

Hazard indications. H PHRASES

H300: Fatal if swallowed.

H310: Fatal in contact with skin.

H314: Causes severe skin burns and eye damage.

H330: Fatal if inhaled.

Prevention advises. P PHRASES

P260: Do not breathe dust/fume/gas/mist/vapours/ spray.

P264: Wash with water thoroughly after handling.

P361: Remove/Take off immediately all contaminated clothing.

P301+P310: IF SWALLOWE D: Immediately call a POISON CENTER or doctor / physician.

P405: Store locked up.

P501: Dispose of cont ents/container to comply wit h legal regulations.

The changes in this s afety data she et with respect to the previous revision are indicated in bold.

Any chemical product may be ha ndled in sa fe conditions if its phy sicochemical and toxicological properties are known, and technical methods and appropriate organising measures are used, as well as adequate personal protective equipment.

The information provided in this safety data shee t is based on o ur current k nowledge. However, the data provided and the recommenda tions made do not imply warranty. It is the responsibility o f the u ser to determine the conditions for safe use of this product.

This safety data sheet has been prepared based on Regulation 453/2010 of the Commission on May 20, 2010 for prep aration of Safety Data Sheet for amending Regulation (EC) No. 19 07/2006 of the Euro pean parliament and Council concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)

Date of review: **JUNE 2014**.